DISCOVERY

Direct foreign investment, rates of interest and currency exchange interactions in Nigeria

Adoms Francis*

To Cite:
Francis A. Direct Foreign Investment, Rates of Interest and Currency Exchange Interactions in Nigeria. *Discovery* 2023; 59: e32d1026

Author Affiliation:
Nnamdi Azikiwe University, Awka, Anambra state, Nigeria

***Corresponding author**
Nnamdi Azikiwe University, Awka, Anambra state
Nigeria
Email: fokadoms@gmail.com

Peer-Review History
Received: 20 January 2023
Reviewed & Revised: 24/January/2023 to 04/February/2023
Accepted: 08 February 2023
Published: March 2023

Peer-Review Model
External peer-review was done through double-blind method.

Discovery
pISSN 2278–5469; eISSN 2278–5450

ABSTRACT

This study adopted an unfussy approach in determining the relationship between FDI, the rate of exchange and interest in Nigeria for the period 1980 to 2020. Using the least squares approach, we outlined a linear model of FDI. An important finding was that the rate of exchange and interest are major factors that influences FDI since the 1980's. We showed that exchange rate exhibits a considerable positive link with the extent of FDI, but the rate of interest was not substantial on FDI. Also, interest rate contributes negatively to FDI which is line with apriori. The Johansen and Juselius, (1988) maximum likelihood method shows that the rates of exchange and interest influences FDI eventually in the long term. It is however resolved that the rates of exchange and interest are critical in the determination of foreign investment in Nigeria. Therefore, it is recommended that Nigeria, a developing country, must communicate trade and monetary policies that will boost foreign investment inflow and will also synchronize with an optimal interest rate operation in Nigeria.

Keywords: FDI, Rate of Currency Exchange, Rate of Interest

1. INTRODUCTION

It is notable in both finance and economic literature that direct foreign investment (FDI) avails some economic advantages as it considerably provides funds for stock, job creation, skills, technological transfer and globalization. Nevertheless, the government of Nigeria have explored various measures to draw FDI through a variety of policy initiatives or reforms. Some of which includes; economic deregulation, the 1989 industrial policy, setting up the Nigeria Investment Promotion Commission (NIPC) and the signing of Bilateral Investment Treaties (BITS). Recently, it included the economic and Financial Crimes Commission (EFCC) and the Independent Corrupt Practices Commission (ICPC) to checkmate corruption which was recognized as a key obstacle to maximizing the gains of FDI.

Despite efforts by the government to be responsible for a beneficial investment macroclimate for foreign investment, the country's increase in direct foreign investment have not been promising. Unfortunately, despite Nigeria's abundance of natural resources, human capital, favorable climate and market, it is not luring in the appropriate amount of international investment. The country has not benefited significantly from foreign direct investment, according to the data

DISCOVERY SCIENTIFIC SOCIETY

available. While net foreign investment inflows to developing nations have been increasing consistently, the proportional share of the rising flows lured into the Nigerian economy has not only fluctuated but has gotten worse, according to World Bank figures.

Maximizing FDI profits is essential to Nigeria's effort to realize Vision NV20:2020. According to published evidence, currency and interest rate behavior are key determinants of FDI. Regarding their roles as determinants in the attraction of direct foreign Investment to Nigeria, the exchange rate and interest rate are two such factors that have been the subject of discussion. Simply put, this is because it is believed that FDI reacts to changes in key macroeconomic factors. In contrast, there is obvious little methodical study examining how both exchange rate and interest rate affect direct foreign Investment in Nigeria. Thus, this study aims to address the gap by conducting an analytical examination of the interactions among direct foreign investment, the exchange rate, and interest rates in Nigeria. There are numerous reasons why Nigeria receives so little foreign direct investment. Macroeconomic volatility is one of them, as shown by rising inflation, interest rates and currency rate levels brought on by fiscal ascendency. Additional notable obstacles to direct foreign investment in Nigeria include a lack of infrastructure, expensive and subpar telecommunications, frequent power outages, inadequate water supplies and a poorly maintained road system. Additionally, the current enormous external debt affected how international investors saw the state of the country. This study aims to investigate the relationship between Nigeria's direct foreign investment, interest rate and exchange rate.

Literature Review

In recent years, the rate of currency exchange variability has increased both by itself and on the subject of interest rate variability. These variances have a considerable negative impact on both the value of the assets held in the host nation and the potential future returns on the investment. Due to the significant degree of the rate of currency exchange and interest volatility, a direct investment in a country like Nigeria will have a riskier stream of returns. Direct foreign investment may be impacted by the level of the exchange rate, as stated by Froot and Stein, (1991). As a result of the host nation's currency weakening against their own, foreigners' relative wealth increases, which increases the host nation's appeal to direct foreign investment because companies may buy assets there relatively more reasonably. As a result, a drop in the host currency should result in an increase in foreign direct investment into the nation and a rise in the host currency should result in a decrease.

Okonkwo et al., (2021) attempted to investigate the impact of currency rate volatility on the lack of direct foreign investment in Nigeria using the period 1981 to 2018 as the research' time frame. The Unit Root Test, Stationarity Test, Multi-Collinearity, Co-integration Relationship, Error Correction Model (ECM) and Granger Causality Analyses were among the statistical techniques used by the authors. Their findings provide evidence that foreign direct investment and both real and nominal exchange rates are positively correlated. As a result, the authors argue that in order to draw in foreign investment, the central bank should assure an appropriate flow of forex in the foreign currency market and maintain continuous stability in the level of the exchange rate.

Karimo, (2020) also looked at the dynamics of foreign private capital flows into Nigeria from 2010Q1 to 2019Q4, focusing on the effects of interest rate differential and currency rate movement. His research was based on the Markov Switching Time Varying Transition Probability Modeling and the Interest Rate Parity Theory. The author offered statistical proof that, whereas foreign portfolio investment (FPI) flows considerably explain foreign interest rate differential, aggregate capital and direct foreign investment (FDI) dynamics are not explained by it. He also showed evidence that movement in real exchange rate is significant in elucidating outflows and inflows in FPI and inflows in FDI, but unbiased to aggregate capital flows.

Using the Autoregressive Distributive Lag (ARDL) technique, Onabote et al., (2022) investigated the relationship between the rate of currency exchange, direct foreign investment and economic growth over the years 1981–2018. The exchange rate, direct foreign investment and economic growth all have a long-term link. According to the results, direct foreign investment boosts economic growth and the speed of adjustment is significant at 78.46%. The report suggests, among other things, that the Nigerian government foster an environment that is favorable to the growth of private enterprises. The authors also argue that the government ought to implement measures that will increase investor confidence and encourage significant international investment.

Another element linking the relationship between interest rate, exchange rate and foreign direct investment is the effects of inflation. An inflationary shock will affect both interest and exchange rates since the nominal interest rate and the rate of currency exchange are affected by expected inflation and the relative rates of domestic and international inflation, respectively. Theoretically, one can anticipate that inflation shocks will cause the “nominal” rate of interest and rate of currency exchange to correlate negatively. Ogu, (2019), for instance, used OLS to examine the relationship between the currency rate, interest rate, inflation, gross fixed capital creation, gross domestic product and direct foreign investment in Nigeria. According to the conclusions of his research, direct foreign investment and exchange rate volatility are positively correlated. The findings also indicated that while variables like

Gross Fixed Capital Formation and Gross Domestic Product had a negative link with the inflow of direct foreign investment in Nigeria, interest rates and inflation had a favorable impact on it. Therefore, the government must create an enabling financial and infrastructure environment to draw in the agricultural, solid mineral and agro-allied industries.

Emmanuel et al., (2019) used a dataset for the years 2006 to 2018 that is based on Johansen Co-integration analysis to assess the impact of rates of currency and interest on direct foreign Investment in Nigeria. Their findings suggest that there is a statistically significant positive correlation between the currency rate of exchange and direct foreign investment (FDI). Furthermore, they provided co-integrating evidence showing, despite the lack of statistical significance, there was a negative association between rates of interest and direct foreign investment (FDI). On the other hand, inflation had a long-term negative relationship with direct foreign investment (FDI). According to the authors, FDI is essential for investments in manufacturing, agriculture and the transfer of knowledge to an economy.

Using monthly time series data on rate of currency exchange volatility, foreign direct investment, external reserves, domestic interest rate, real GDP growth rate and trade openness for the years 1986–2016, Adokwe et al., (2019) investigated the impact of exchange rate volatility on direct foreign investment in Nigeria. They did this by combining GARCH and 2SLS techniques. Using the generalized autoregressive conditional heteroscedasticity (GARCH) method, the exchange rate volatility series was estimated. Their research shows that direct foreign investment in Nigeria is negatively yet significantly impacted by the rate of currency exchange fluctuation. As a result of their results, it is advised that Nigeria's foreign exchange system and single interest digit loan management be harmonized.

Using an auto-regressive distributive lag model, Monogbe and Okah, (2017) investigated the relationship between direct foreign investment, the currency rate, interest rates and economic development in Nigeria during the years 1986 to 2015. Our study of their research led us to the conclusion that interest rates and direct foreign investment had a direct impact on Nigeria's economic growth. They also demonstrated how low interest rates encourage investment dilemma and so spur economic growth in Nigeria, while rate of currency exchange demonstrate how economic growth is sped up when rates of currency exchange are rising.

2. METHODOLOGY

The stated equation is estimated using the ordinary least squares equation method. This is because the computation is straightforward and the estimates are linear, unbiased and have the lowest variance possible for a class of unbiased estimates, which are the best properties. Data were gathered from various issues of the "Central Bank of Nigeria" statistical bulletin in all of its editions. In this study, the impact of rates of interests and currency exchange on the flow of direct foreign investment into Nigeria is analyzed. Thus, the model:

$$FDI = \beta_0 - \beta_1 EXR - \beta_2 INT + \mu \quad \ldots\ldots\ldots\ldots\ldots (1)$$

Where:

β_0 = the intercept for equation

β_1= the algebraic estimate of EXR

β_2 =the parameter estimates of INT

μ = the random variable or error term

The random error term is the's μ. The expressions for each variable are all logarithmic. More exactly, $ß_1 > 0$ and $ß_20$ are the expected signs (apriori) for the ß's. Therefore, in order to prevent the issue of erroneous regression that is frequently connected to time series data, we validate the Least Squares assumptions. To determine the quantity of cointegrating equations, we also used the maximum likelihood method proposed by Johansen and Juselius in 1988. Utilizing multiple regression analysis, the model was evaluated. At a 5% level of significance, the F-value was calculated to assess the strength of the association between the variables under examination.

3. PRESENTATION AND ANALYSES OF RESULTS

This section describes the relationship between indicators of direct foreign investment, rates of currency exchange and interests. The table below presents the results obtained from our estimated model, based on the Ordinary Least Squares (OLS) procedure as follows:

Table 1 Log Linear Regression Result

Variable	Coefficient	t-Statistic	Prob.
C	7.496705	9.121620	0.0000
*ln*EXR	1.588823	22.70414	0.0000
*ln*INT	-0.231171	-0.719147	0.4766
R-squared	0.973171		
F-statistic	79.87222		
Prob(F-statistic)	0.000000		

Dependent Variable: Direct Foreign Investment (*ln*FDI)

The regression result above is critically analysed for a logical conclusion, using our statistical instruments that are mentioned in the part before. Our R^2 has been computed using the Econometric View (E View) software package as 0.973171. This infers that our regression result has "a good fit", thus it is good for prediction and policy purpose. Additionally, it is implied that there is a strong correlation between the exchange rate and foreign direct investment in Nigeria. The tabulated F-value (3.32) is less than the computed F-value (79.87222).

However, the formula F-value is used to generate the tabulated $F^{k-1}{}_{n-k.}$ Where *k* is the number of parameters, and n is the number of observations. The alternative hypothesis, which states that the overall estimated parameter is statistically significant, is not rejected, whereas the null hypothesis, which states that the overall estimated parameter is not statistically significant, is rejected.

A favorable and strong correlation between the rate of currency exchange and direct foreign investment in Nigeria was discovered by the study. As a result, the coefficient of 1.588823 found suggests that a rise in the rate of Naira/Dollar currency exchange will cause an increase in direct foreign investment (FDI) of roughly 1.6%; the hypothesis test also reveals a substantial correlation between rate of currency exchange and FDI in Nigeria. This suggests that while Naira appreciation tends to slow foreign investment influx into Nigeria, Naira devaluation tends to encourage it, notably in the form of import. It is also considerable at 5%, demonstrating the importance of the Naira's rate of exchange to attracting foreign investment into the nation over the time period under consideration.

Additionally, the rate of interest conforms to our apriori by showing a negative sign. At a level of 5 percent, it is not significant. For international investors and borrowers, funds become more affordable when the rate of interest drop. Since foreign investors are more ready to borrow money at lower rates of interest, a reduction in the rates of interest promotes growth. To encourage quick and sustained direct foreign investment and economic growth in Nigeria, the present rate of interests on bank loans is still relatively high. Since SAP was introduced in 1985 and a number of financial sector reforms have been implemented, rates of interest on loans in Nigeria have increased.

Model Diagnostic Testing

Using the EViews 12 program, the following diagnostic tests were carried out, to ascertain the core assumptions of OLS. They include:

Test for Specification Error

This study employed the test proposed by Ramsey, (1969) (in Gujarati and Sangeetha, 2007) called RESET (Regression Specification error test). The guiding idea for this test is to accept the hypothesis that the model is incorrectly described if the estimated F-value is significant (5%). On the other hand, it suggests mis-specification if the R^2 is statistically significant (based on the F-test). The F-value of 2.567693 (ϱ 0.059313) obtained from the table below is statistically insignificant, thus we draw the conclusion that the estimated model does not contain any specification errors.

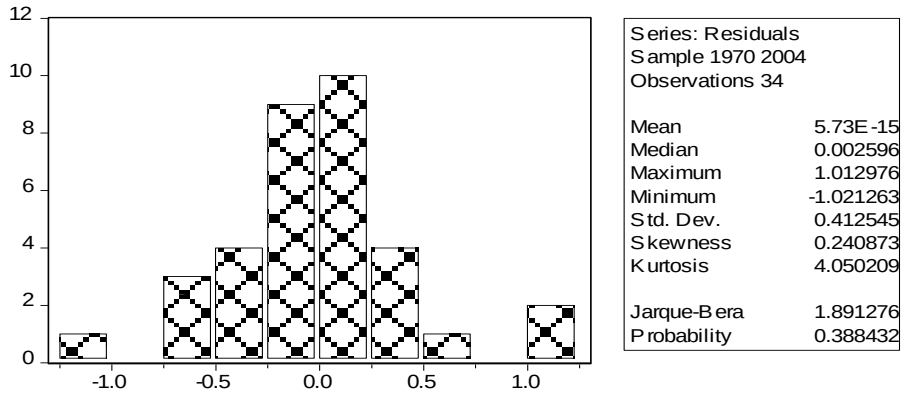
Table 2 Ramsey Reset Test

Options				Inference
F-statistic	2.567693	Probability	0.059313	No specification error
Log likelihood ratio	2.677611	Probability	0.053455	No specification error

Source: Author's Computation using EViews 12

Test for Residual Normality

In this study, the Jarque-Bera (JB) test of normality is used just to confirm that the residuals are regularly distributed. The residuals' null hypothesis, under which it is conducted, is that they are evenly distributed. We do not deny the idea that the error terms are normally distributed based on the illustration below, where the computed value of the JB statistic (0.388432) under the normality assumption.



Source: Author's Computation

Stationarity tests using Unit roots

The table 3 below shows the results from Augmented Dickey- Fuller (ADF) unit root test with an intercept;

Table 3 Unit Root Test of Stationarity Results

Test	Variables	Levels		Differences		Order of Integration
		t- statistic	Critical	t- statistic	Critical	
ADF	FDI			-3.074626	-2.6369	I (1)
	EXR			-4.598531	-3.6422	I (1)
	INT			-3.286037	-2.6196	I (1)

Note: * Implies significance at 1%

Source: Author's Computation based on data from Central Bank of Nigeria Publications

The results of the unit root test demonstrate that all the variables are integrated of the order one, I (1), according to an application of the Augmented Dickey- Fuller (ADF) test, indicating that they are stationary at their initial difference.

Johansen Test for Cointegration

The test that Johansen proposed serves as the foundation for co-integration. They claim that the theory of cointegration naturally results from the analysis of and testing for unit roots because cointegration deals with the methodology of modeling non-stationary time series variables (Iyoha and Ekanem, 2002). However, the table below shows the conclusions drawn from the co-integration test that was performed.

Table 4 Test for cointegration

Eigen value	Likelihood ratio	5% critical value	1% critical value
0.583668	66.50701	48.52	56.07
0.426032	37.59004	27.21	34.46
0.319562	19.26907	19.68	15.65

Because the likelihood ratio is higher than the crucial values, the aforementioned table demonstrates that the variables are cointegrated. As a result, we can conclude that the calculated model contains a cointegrating equation.

4. CONCLUDING REMARK

This study aims to strengthen the relationship between Nigeria's rates of interest, rate of currency exchange, and direct foreign investment. The findings suggest that rates of exchange have an important and favorable impact on direct foreign investment in Nigeria. This suggests that the rates of currency exchange and direct foreign investment in Nigeria are rising simultaneously. Furthermore, our findings confirm that an increase in interest rates tends to have a detrimental effect on foreign investment in Nigeria. Therefore, we conclude that a prolonged decline in the rates of interest has led to an increase in direct foreign investment. It is clear from this that operations on the foreign exchange market have the potential to affect the amount of foreign investment in the Nigerian economy. Economic growth and other macroeconomic goals are pursued through foreign direct investment. It is anticipated that the amount of foreign investment inflows may be influenced by operations on the foreign currency market and the cost of loanable funds. The results demonstrate that the rates of currency exchange have the power to increase the level of direct foreign investment in Nigeria, however it is also implied that lower loanable finance costs will attract more international investors. The study therefore recommends that the government strengthen measures that will encourage foreign investment inflow and will also be in harmony with an ideal rates of interest operation in Nigeria.

JEL: F21, F31, E4

Informed consent

Not applicable.

Ethical approval

Not applicable.

Conflicts of interests

The authors declare that there are no conflicts of interests.

Funding

The study has not received any external funding.

Data and materials availability

All data associated with this study are present in the paper.

REFERENCES AND NOTES

1. Adokwe EI, Agu AO, Maduka AC. Exchange Rate Volatility and Foreign Direct Investment: The Nigerian Experience. J Bus Econ 2019; 6(4):78-87.
2. Emmanuel B, Ike EC, Alhasan Y. Effect of Exchange and Interest Rates on Foreign Direct Investment in Nigeria 2006-2018. Int J Contemp Res Rev 2019; 10(07):21572–21585.
3. Froot K, Stan J. Exchange rates and Foreign Direct Investment: An imperfect capital markets Approach, Q J Econ 1991; 196:11 91–1218.
4. Gujarati DN, Sangeetha. Basic Econometrics, New Delhi, Tata McGraw- Hill Publishing Company Limited 2007.
5. Karimo TM. Impact of Interest Rate Differential and Exchange Rate Movement on the Dynamics of Nigeria's International Private Capital Flows. CBN J Appl Stat 2020; 11(2):29-63.
6. Monogbe TG, Okah OJ. The Consociation between Investment, Exchange Rate, Interest Rate and Economic Development in Nigeria (ARDL Approach). Saudi J Busi Manag Stud 2017; 2(8):744-753.
7. Ogu C. Foreign Direct Investment and Exchange Rate in Nigeria. Glob J Appl Manag Soc Sci 2019; 16(1):132–145.
8. Okonkwo JJ, Osakwe CI, Nwadibe EC. Exchange Rate and Foreign Direct Investment in Nigeria 1981-2018. Int J Acad Res Bus Soc Sci 2021; 11(1):213–232.
9. Onabote AA, Adama IJ, Obasaju B, Ohwofasa B, Eluyela D, Popoola O. Exchange Rate, Foreign Direct Investment and Economic Growth Nexus in Nigeria. Int J Engl Lit Soc Sci 2022; 7(1):304-312.